

**Notice of Allowability**

Application No.

10/766,031

Applicant(s)

HATA ET AL.

Examiner

Matthew C. Landau

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed November 30, 2007.
2. ☒ The allowed claim(s) is/are 1-4,6-13 and 15-26.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All   b) ☐ Some\*   c) ☐ None   of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |  |  |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)   | 5. <input type="checkbox"/> Notice of Informal Patent Application                      |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br>Paper No./Mail Date <u>11/30/07</u> | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                    |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material                   | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance   |
|  | 9. <input type="checkbox"/> Other _____.   |

### EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Brian Seidleck on January 9, 2008.

Please amend the claims as follows:

18. (Currently Amended) A semiconductor device comprising:
- a semiconductor element layer formed on the front surface of a substrate and provided with a region of a front surface of said semiconductor element layer having concentrated dislocations at least on part of the front surface thereof while including an active layer;
  - a front electrode formed to be in contact with a region of the front surface of said semiconductor element layer other than said region of the front surface having said concentrated dislocations; and
  - a back electrode provided in contact with [[on]] a back surface of said substrate, wherein the upper surface of said region of the front surface having said concentrated dislocations is partially removed by a prescribed thickness and located downward beyond said active layer.

21. (Currently Amended) A LED (light-emitting diode device) comprising:

a substrate including a first region having a first thickness and a second region provided with a region of a front surface having concentrated dislocations at least on part of the front surface thereof while having a second thickness smaller than said first thickness;

a semiconductor element layer formed on a first region of a front surface of said substrate other than said second region provided with said region of the front surface having said concentrated dislocations, said semiconductor element layer includes an active layer;

a front electrode formed to be in contact with the front surface of said semiconductor element layer; and

a back electrode provided in contact with [[on]] a back surface of said substrate.

24. (Currently Amended) A semiconductor device comprising:

a substrate provided with a region of a front surface having concentrated dislocations at least on part of the front surface thereof;

a first selective growth mask formed on a region of the front surface of said substrate located inward beyond said region of the front surface having said concentrated dislocations with a width smaller than the width of said region of the front surface having said concentrated dislocations;

a semiconductor element layer formed on a region of the front surface of said substrate other than a region formed with said first selective growth mask;

a front electrode formed to be in contact with a portion of a front surface of said semiconductor element layer located inside said first selective growth mask; and

a back electrode provided in contact with [[on]] a back surface of said substrate.

*Allowable Subject Matter*

Claims 1-4, 6-13, and 15-26 are allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claims 1, 4, and 9, the reasons for allowance were provided in the Office Action mailed on July 25, 2007.

Regarding claim 13, the prior art of record, either singularly or in combination, does not disclose or suggest the combination of limitations including a high resistance region formed in said region of the front surface having said concentrated dislocation, said high resistance region including a carbon introduction layer formed by introducing said carbon.

Regarding claim 18, the prior art of record, either singularly or in combination, does not disclose or suggest the combination of limitations including a back electrode in contact with a back surface of said substrate, wherein the upper surface of said region of the front surface having said concentrated dislocations is partially removed by a prescribed thickness and located downward beyond said active layer.

Regarding claim 21, the prior art of record, either singularly or in combination, does not disclose or suggest the combination of limitations including a substrate including a first region having a first thickness and a second region provided with a region of a front surface having concentrated dislocations at least on part of the front surface thereof while having a second thickness smaller than said first thickness; and a back electrode provided in contact with a back surface of said substrate.

Regarding claim 24, the prior art of record, either singularly or in combination, does not disclose or suggest the combination of limitations including a first selective growth mask formed on a region of the front surface of said substrate located inward beyond said region of the front surface having said concentrated dislocations with a width smaller than the width of said region of the front surface having said concentrated dislocations; and a back electrode provided in contact with a back surface of said substrate.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Landau whose telephone number is 571-272-1731. The examiner can normally be reached on 9:00AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Parker can be reached on 571-272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Application/Control Number:  
10/766,031  
Art Unit: 2815

Page 6

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Matthew C. Landau  
Primary Examiner  
Art Unit 2815  
1/9/08